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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/591,511	09/01/2006	Michael Dankert	2004P00710WOUS	1650

22116 7590 01/02/2009

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EXAMINER	
KIM, TAE JUN	

ART UNIT	PAPER NUMBER
3741	

MAIL DATE	DELIVERY MODE
01/02/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/591,511	DANKERT ET AL.	
	Examiner	Art Unit	
	Ted Kim	3741	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11/11/2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *19-22,24-30 and 32-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *19-22,24-30 and 32-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 19-22, 24-30, 32-34 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicant has demonstrated possession of the limitation now introduced in the independent claims. However, applicant has not demonstrated possession of using a common current oscillation characteristic value for all the dependent claims, e.g. when the turbine is not operating or stationary. Applicant provides no disclosure of how this limitation is to be implemented other than possibly an inductive sensor that picks up the signal of multiple blades as the blades pass. Applicant has also not enabled all the use of the different signal types listed in e.g. claims 26, 34 for combination with this limitation. Applicant is required to demonstrate possession of these limitations in combination with each other in order to obviate this rejection.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 19, 20, 22, 24-28, 30, 32-34 are rejected under 35 U.S.C. 102(b) as being anticipated by Wu et al (4,335,600). Wu teaches a method for detecting contamination (deposit buildup) on a turbine component of a turbine, comprising: pre-determining a reference oscillation characteristic value of the turbine component (see e.g. Fig. 5 and col. 4, lines 30+); determining a current oscillation characteristic value of the turbine component (see e.g. Fig. 6); comparing the current oscillation characteristic value with the pre-determined oscillation characteristic value; and assessing the contamination level of the turbine component based on the comparison (see col. 3, lines 22+; col. 4, lines 66+), wherein the current oscillation characteristic value is determined when the turbine is operating, wherein the turbine component is a turbine blade 21, wherein a common current oscillation characteristic value (e.g. the sensed pressure or vibration is common to the entire turbine stage) is determined for a plurality of turbine components 21 that operate comparably (i.e. the turbine blades), wherein the plurality of turbine components operated in a comparable manner is a row of turbine blades, wherein the plurality of

turbine components direct a hot gas, wherein the current oscillation characteristic value is a behavior of the turbine component that is selected from the group consisting of: inherent frequency, oscillation frequency, oscillation amplitude, attenuation characteristic value and oscillation decay. A device for determining a degree of contamination on a turbine component of a turbine, comprising: a sensor unit 22 or 24 that determines a current oscillation characteristic value of the turbine component; and a processor unit 27, 29 that compares the current oscillation characteristic value of a turbine component with a pre-determined reference oscillation characteristic value of a turbine component and determines the degree of contamination of the turbine component based on the comparison, wherein the current oscillation characteristic value is determined while the turbine is operating, wherein the turbine component is a turbine blade 21, wherein a common current oscillation characteristic value is determined by the sensor unit for a plurality of turbine components that operate comparably, wherein the plurality of turbine components that operate comparably is a row of turbine blades; wherein the plurality of turbine components direct a hot gas; wherein the current oscillation characteristic value is a behavior of the turbine component that is selected from the group consisting of: inherent frequency, oscillation frequency, oscillation amplitude, attenuation characteristic value and oscillation decay.

5. Claims 19-22, 24-30, 32-34 are rejected under 35 U.S.C. 102(b) as being anticipated by Harrold 2003/0056595). Harrold teaches a method for detecting contamination on a turbine component of a turbine, comprising: pre-determining a

reference oscillation characteristic value of the turbine component; determining a current oscillation characteristic value of the turbine component; comparing the current oscillation characteristic value with the pre-determined oscillation characteristic value (page 1, paragraph 006 or also note that this inherent with Fourier analysis of page 3, paragraph 0040+); and assessing the contamination level of the turbine component based on the comparison (paragraph 0037), wherein the current oscillation characteristic value is determined when the turbine is operating, wherein the current oscillation characteristic value is determined while the turbine is not operating [note that using salt grains, as described in the experiment of paragraph 0039 would constitute an operation where the turbine does not operate]; wherein the turbine component is a turbine blade, wherein a common current oscillation characteristic value is determined for a plurality of turbine components that operate comparably [the acoustic signals are a common signal for a plurality of turbine blades], wherein the plurality of turbine components operated in a comparable manner is a row of turbine blades, wherein the plurality of turbine components direct a hot gas, wherein the current oscillation characteristic value is a behavior of the turbine component that is selected from the group consisting of: inherent frequency, oscillation frequency, oscillation amplitude, attenuation characteristic value and oscillation decay. A device for determining a degree of contamination on a turbine component of a turbine, comprising: a sensor unit 28 that determines a current oscillation characteristic value of the turbine component; and a processor unit (required to do a Fourier analysis) that compares the current oscillation characteristic value of a turbine

component with a pre-determined reference oscillation characteristic value of a turbine component and determines the degree of contamination of the turbine component based on the comparison, wherein the current oscillation characteristic value is determined while the turbine is operating, wherein the oscillation characteristic value is determined while the turbine is stationary (the oscillation can be done for the stationary turbine vanes, see page 2, paragraph 0034], wherein the turbine component is a turbine blade, wherein a common current oscillation characteristic value is determined by the sensor unit for a plurality of turbine components that operate comparably, wherein the plurality of turbine components that operate comparably is a row of turbine blades; wherein the plurality of turbine components direct a hot gas; wherein the current oscillation characteristic value is a behavior of the turbine component that is selected from the group consisting of: inherent frequency, oscillation frequency, oscillation amplitude, attenuation characteristic value and oscillation decay.

6. Claims 19, 20, 22, 24-30, 32-34 are rejected under 35 U.S.C. 102(e) as being anticipated by Brown et al (2005/0011278). Brown teaches a method for detecting contamination on a turbine component of a turbine, comprising: pre-determining a reference oscillation characteristic value of the turbine component; determining a current oscillation characteristic value of the turbine component; comparing the current oscillation characteristic value with the pre-determined oscillation characteristic value; and assessing the contamination level of the turbine component based on the comparison (see page 2, paragraph 0020, 0025), wherein the current oscillation characteristic value is

determined when the turbine is operating, wherein the turbine component is a turbine blade, wherein a common current oscillation characteristic value is determined for a plurality of turbine components that operate comparably [the acoustic signal is a common value of a plurality of turbine blades], wherein the plurality of turbine components operated in a comparable manner is a row of turbine blades, wherein the plurality of turbine components direct a hot gas, wherein the current oscillation characteristic value is a behavior of the turbine component that is selected from the group consisting of: inherent frequency, oscillation frequency, oscillation amplitude, attenuation characteristic value and oscillation decay. A device for determining a degree of contamination on a turbine component of a turbine, comprising: a sensor unit that determines a current oscillation characteristic value of the turbine component; and a processor unit that compares the current oscillation characteristic value of a turbine component with a pre-determined reference oscillation characteristic value of a turbine component and determines the degree of contamination of the turbine component based on the comparison, (see page 2, paragraph 0020, 0025) wherein the current oscillation characteristic value is determined while the turbine is operating, wherein the turbine component is a turbine blade, wherein a common current oscillation characteristic value is determined by the sensor unit 106 for a plurality of turbine components that operate comparably, wherein the plurality of turbine components that operate comparably is a row of turbine blades; wherein the plurality of turbine components direct a hot gas; wherein the current oscillation characteristic value is a behavior of the turbine component

that is selected from the group consisting of: inherent frequency, oscillation frequency, oscillation amplitude, attenuation characteristic value and oscillation decay.

7. Claims 19-22, 24-30, 32-34 are rejected under 35 U.S.C. 102(b) as being anticipated by Rhines et al (4,339,719). Rhines et al teach a method for detecting contamination on a turbine component of a turbine (see col. 1, lines 6-11), comprising: pre-determining a reference oscillation characteristic value of the turbine component 80; determining a current oscillation characteristic value of the turbine component; comparing the current oscillation characteristic value with the pre-determined oscillation characteristic value [an oscillation signal from 134 supplies an oscillating signal to coil 132 and 132 and the switching network and electrode pairs 30, 32, see col. 4, lines 36-col. 5, lines 33]; and assessing the contamination level of the turbine component based on the comparison, wherein the current oscillation characteristic value is determined when the turbine is operating, wherein the current oscillation characteristic value is inherently capable of being determined while the turbine is not operating, wherein the turbine component is a turbine blade, wherein a common current oscillation characteristic value is determined for a plurality of turbine components that operate comparably [see the combined signal in col. 5, line 34-58], wherein the plurality of turbine components 80 operated in a comparable manner is a row of turbine blades, wherein the plurality of turbine components direct a hot gas, wherein the current oscillation characteristic value is a behavior of the turbine component that is selected from the group consisting of: inherent frequency, oscillation frequency, oscillation amplitude, attenuation characteristic

value and oscillation decay. A device for determining a degree of contamination on a turbine component of a turbine, comprising: a sensor unit 20 that determines a current oscillation characteristic value of the turbine component 80; and a processor unit that compares the current oscillation characteristic value of a turbine component with a pre-determined reference oscillation characteristic value of a turbine component and determines the degree of contamination of the turbine component based on the comparison, wherein the current oscillation characteristic value is determined while the turbine is operating, wherein the oscillation characteristic value is inherently capable of being determined while the turbine is stationary, wherein the turbine component is a turbine blade 80, wherein a common current oscillation characteristic value is determined by the sensor unit for a plurality of turbine components that operate comparably, wherein the plurality of turbine components that operate comparably is a row of turbine blades; wherein the plurality of turbine components direct a hot gas; wherein the current oscillation characteristic value is a behavior of the turbine component that is selected from the group consisting of: inherent frequency, oscillation frequency, oscillation amplitude, attenuation characteristic value and oscillation decay. Note that the sensor inherently has a pre-determined reference oscillation characteristic value of a turbine component, even if this value is zero, as there must be a standard for comparison in order for the electric signal to have any meaning in a measurement. As for performing the determination when the turbine is stationary or not operating, Rhines et al is inherently

capable of doing so, such as during conditions such as after the turbine is stopped and the monitoring equipment instrumentation still on.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 19-22, 24-30, 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rhines et al (4,339,719) in view of any of Wehde (4,238,789) and Wu et al (4,335,600). Rhines et al must inherently use a pre-determined reference oscillation characteristic value. Alternately, Wehde teaches using a comparison between the current oscillation characteristic value with the pre-determined oscillation characteristic value to determine the amount of contaminants (see col. 2, lines 17-33). Wu et al also teach using a comparison between the current oscillation characteristic value with the pre-determined oscillation characteristic value to determine the amount of contaminants (see e.g. Figs. 5 and 6). It would have been obvious to one of ordinary skill in the art to employ a comparison between the current oscillation characteristic value with the pre-determined oscillation characteristic value to determine the amount of contaminants, as taught by any of Wehde and Wu et al, in order to provide a conventional way of determining the value of the oscillation value with respect to a reference value. As for performing the

determination when the turbine is stationary or not operating, this would be obvious to one of ordinary skill in the art because this limitation would be met during conditions such as after the turbine is stopped and the monitoring equipment instrumentation still on. This would positively read on the applicant's device and would have been obvious to do so as an obvious matter of monitoring the turbine even when stationary or not operating to evaluate the level of containments.

10. Claims 19-22, 24-30, 32-34 are rejected under 35 U.S.C. 102(b) as being anticipated by Harrold 2003/0056595). Harrold teaches a method for detecting contamination on a turbine component of a turbine, comprising: pre-determining a reference oscillation characteristic value of the turbine component; determining a current oscillation characteristic value of the turbine component; comparing the current oscillation characteristic value with the pre-determined oscillation characteristic value (page 1, paragraph 006 or also note that this inherent with Fourier analysis of page 3, paragraph 0040+); and assessing the contamination level of the turbine component based on the comparison (paragraph 0037), wherein the current oscillation characteristic value is determined when the turbine is operating, wherein the current oscillation characteristic value is determined while the turbine is not operating [note that using salt grains, as described in the experiment of paragraph 0039 would constitute an operation where the turbine does not operate]; wherein the turbine component is a turbine blade, wherein a common current oscillation characteristic value is determined for a plurality of turbine components that operate comparably, wherein the plurality of turbine components

operated in a comparable manner is a row of turbine blades, wherein the plurality of turbine components direct a hot gas, wherein the current oscillation characteristic value is a behavior of the turbine component that is selected from the group consisting of: inherent frequency, oscillation frequency, oscillation amplitude, attenuation characteristic value and oscillation decay. A device for determining a degree of contamination on a turbine component of a turbine, comprising: a sensor unit 28 that determines a current oscillation characteristic value of the turbine component; and a processor unit (required to do a Fourier analysis) that compares the current oscillation characteristic value of a turbine component with a pre-determined reference oscillation characteristic value of a turbine component and determines the degree of contamination of the turbine component based on the comparison, wherein the current oscillation characteristic value is determined while the turbine is operating, wherein the oscillation characteristic value is determined while the turbine is stationary (the oscillation can be done for the stationary turbine vanes, see page 2, paragraph 0034], wherein the turbine component is a turbine blade, wherein a common current oscillation characteristic value is determined by the sensor unit for a plurality of turbine components that operate comparably, wherein the plurality of turbine components that operate comparably is a row of turbine blades; wherein the plurality of turbine components direct a hot gas; wherein the current oscillation characteristic value is a behavior of the turbine component that is selected from the group consisting of: inherent frequency, oscillation frequency, oscillation amplitude, attenuation characteristic value and oscillation decay. A method for

detecting contamination on a turbine component of a turbine, comprising: determining a current oscillation characteristic value of a turbine component. Harold teaches the claimed invention and teaches comparing the current oscillation characteristic value with the pre-determined oscillation characteristic value (page 1, paragraph 006 or also note that this inherent with Fourier analysis of page 3, paragraph 0040+). Alternately, seeing how comparing the current oscillation characteristic value with the pre-determined oscillation characteristic value is practiced with the conventional art discussed by Harold, it would have been obvious to one of ordinary skill in the art to employ with the inventive subject matter of Harold, as being the typical practice in the art. Yet another alternative is the teaching of the Brown et al reference who specifically teaches the use of Fast Fourier Transform Analysis to determine acoustic noise, specifically comparing the current oscillation characteristic value with the pre-determined oscillation characteristic value with that process (see page 2, paragraph 0030). It would have been obvious to one of ordinary skill in the art to employ the Fast Fourier Transform method of comparing the current to pre-determined, oscillation values, in a manner consistent with teachings of Harold who also uses the Fourier Transform analysis to determine the values of the oscillation. Furthermore, Brown would specifically teach using the acoustic sensors to determine the amount of contaminent build up on the turbine components. It would have been obvious to one of ordinary skill in the art to use the acoustic sensors to determine the amount of contaminant build on the turbine components, as taught by Brown, in order to determine proper operation thereof.

11. Claims 19-22, 24-30, 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu et al (4,335,600) as applied above, and further in view of Tsuboi et al (5,907,098). Wu teaches the use of vibration sensors to detect the amount of containments and wear/defects on the turbine blades. Wu does not specifically teach this is done while the turbine is stationary. Tsuboi et al teach a turbine blade (col. 10, lines 20+) with a vibration sensor (see Fig. 5) where the vibration sensor picks up the vibration signal when the turbine is stationary or off and vibrated by an impact technique (see col. 11, lines 9+) in a manner analogous to that disclosed by applicant, in order to determine the wear or defects in the turbine blades and also uses spectral analysis with the oscillation characteristic values to determine the problems with the blades where the current oscillation values are compared with pre-determined oscillation characteristic value (see e.g. col. 12, lines 25+). Wu teaches that vibration signal will change as a matter of the deposit buildup on the turbine components (col. 3, lines 22+). It would have been obvious to one of ordinary skill in the art to employ the vibration analysis techniques taught by Tsuboi et al, with impact testing a stationary blade or when the turbine is off, to determine the buildup of the contaminants on the turbine blades, in order to use an equivalent technique in the art and/or to employ the additional fine wear/defection abilities that can be done with stationary blade impact testing.

Response to Arguments

12. Applicant's arguments filed 11/11/2008 have been fully considered but they are not persuasive. Applicant's argument concerning the limitation formerly in claims 23

and 31 of "wherein a common current oscillation characteristic value is determined for a plurality of turbine components that operate comparably" alleging this limitation is not in the references is not persuasive. In each of the applied references, the common current oscillation characteristic value (e.g. the sensed pressure or vibration or acoustic signal is common to the entire turbine stage) is determined for a plurality of turbine components that operate comparably (i.e. the turbine blades). These signals are by nature common signals, e.g. the pressure or vibration or acoustics are not generated by a single turbine blade but an entire set of turbine blades, therefore each of these signals are a common current oscillation value determined for a plurality of turbine components which operate comparably.

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the

advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ted Kim whose telephone number is 571-272-4829. The Examiner can be reached on regular business hours before 5:00 pm, Monday to Thursday and every other Friday.

The fax number for the organization where this application is assigned is 571-273-8300.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cuff, can be reached at 571-272-6778. Alternate inquiries to Technology Center 3700 can be made via 571-272-3700.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). General inquiries can also be directed to the Patents Assistance Center whose telephone number is 800-786-9199. Furthermore, a variety of online resources are available at http://www.uspto.gov/main/patents.htm

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